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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/682,443	09/04/2001	Michiel Jacques van Nieuwstadt	200-1758 JDR	9487
22844	7590	05/17/2004	EXAMINER	
FORD GLOBAL TECHNOLOGIES, LLC. SUITE 600 - PARKLANE TOWERS EAST ONE PARKLANE BLVD. DEARBORN, MI 48126			NGUYEN, TU MINH	
			ART UNIT	PAPER NUMBER
			3748	

DATE MAILED: 05/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/682,443

Applicant(s)

VAN NIEUWSTADT, MICHEL
JACQUES

Examiner

Tu M. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 4-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 4-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. An Applicant's Request for Continued Examination (RCE) and an Applicant's Amendment filed on May 7, 2004 have been entered.

Claims 4-7, 9, 10, 12, and 13 have been amended; and claims 14-19 have been added.

Overall, claims 1 and 4-19 are pending in this application.

Drawings

2. The formal drawing of Figure 2 filed on September 24, 2003 has been approved for entry.

Specification

3. The disclosure is objected to because on page 4, paragraph 0014, the sentence is incomplete. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office Action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 4, and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Bagley et al. (U.S. Patent 5,497,617).

Re claim 1, as illustrated in Figure 2 and indicated in claims 1-2, Bagley et al. disclose a method for controlling hydrocarbon (methanol) injection into an engine exhaust to reduce NO_x, comprising injecting the hydrocarbon into the engine exhaust in accordance with detection of a light-off event, such light-off event being detected when there is a hydrocarbon-oxygen reaction wherein an exothermic reaction is produced and detected (Figure 2 shows that a mixture of methanol and air has an ignition temperature at a catalyst temperature as low as 50°C and thus, exhibits an exotherm as shown; as claimed in claims 1-2, Bagley et al. utilize a heater to raise a catalyst temperature to an ignition temperature of a mixture of methanol and air; they then supply the mixture of methanol and air into the catalyst, resulting in the combustion of said mixture and raising the catalyst temperature until the catalyst reaches light-off temperatures for other components (NO_x, HC, CO) in the exhaust gas).

Re claims 4 and 12, as illustrated in Figure 2 and indicated in claims 1-2, Bagley et al. disclose a method for controlling hydrocarbon (methanol) injection into an engine exhaust to reduce NO_x in such exhaust, such engine exhaust with the NO_x and the injected hydrocarbon being directed to a catalyst for reaction therein, comprising:

(a) detecting an exothermic reaction across the catalyst (step b) in claim 1; also see Figure 2 where an exotherm for methanol is detected when a catalyst temperature reaches approximately 50°C);

(b) measuring a temperature of the catalyst in response to the detected exothermic reaction (from Figure 2, a catalyst temperature of about 50°C is measured when an exotherm for methanol is detected); and

(c) injecting the hydrocarbon into the reaction in accordance with the measured temperature (step c) in claim 1).

6. Claims 4-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Hirota et al. (U.S. Patent 5,201,802).

Re claims 4, 12, and 14, as shown in Figures 6 and 14, Hirota et al. disclose a method for controlling hydrocarbon injection into an engine exhaust to reduce NO_x in such exhaust, such engine exhaust with the NO_x and the injected hydrocarbon being directed to a catalyst (6) for reaction therein, comprising:

(a) detecting an exothermic reaction across the catalyst (step 608);

(b) measuring a temperature of an inlet of the catalyst in response to the detected exothermic reaction (step 608) (an inlet temperature t₁ is detected and measured using an upstream temperature sensor (24)); and

(c) injecting the hydrocarbon into the reaction in accordance with the measured temperature (steps 618 and 620).

Re claims 5, 6, 10, 13, 15, 16, and 19, as illustrated in Figures 6 and 14-18, Hirota et al. disclose a method for controlling hydrocarbon injection into an engine exhaust to reduce NO_x in such exhaust, such engine exhaust with the NO_x and the injected hydrocarbon being directed to a catalyst (6) for reaction therein, comprising:

- (a) detecting a pair (t_1 and t_2) of temperatures across the catalyst to provide a temperature difference (Δt) indicating an exothermic reaction across the catalyst (step 608);
 - (b) comparing the temperature difference with a predetermined temperature threshold (ΔT_i) (step 610);
 - (c) determining an exothermic condition temperature (T_1) when the temperature difference is determined to exceed the threshold (step 614, Figure 17), such exothermic condition temperature being determined from an upstream one of the detected temperatures;
 - (d) comparing the determined exothermic condition temperature with an exothermic condition temperature (550 in Figure 17) expected from the catalyst at a time prior to the determined exothermic condition temperature; and
 - (e) modifying the injected hydrocarbon in accordance with the last-mentioned comparison (steps 618 and 620; also see Figure 18 and line 10 of column 9 to line 3 of column 10) (Hirota et al. determine in advance a desired lower limit catalyst inlet temperature T_1 and a desired upper limit catalyst outlet temperature T_2 for the optimum reduction of NO_x as a function of the degradation extent DR (Figure 17). For a non-deteriorated catalyst, T_1 and T_2 equal 450 and 550, respectively. If a detected temperature difference (Δt) across the catalyst is different from a predetermined temperature threshold (ΔT_i), a degradation extent DR is calculated (step 612); and a set of desired temperature values T_1 and T_2 are determined based on the calculated DR (step 614). A hydrocarbon concentration H_1 is also determined based on DR).
- Re claims 7, 9, 17, and 18, as shown in Figures 6 and 14-18, Hirota et al. disclose a system and a processor (10) for controlling hydrocarbon injection into an engine exhaust to

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reduce NO_x in such exhaust, such engine exhaust with the NO_x and the injected hydrocarbon being directed to a catalyst (6) for reaction therein, the system comprising:

(a) a catalyst (6) for facilitating a reaction between the injected hydrocarbon and NO_x in the exhaust;

(b) a hydrocarbon injector (14) for injecting the hydrocarbon into the exhaust upstream of the catalyst;

(c) a detecting system comprising:

- a pair of sensors (24, 20) each detecting a common parameter in the exhaust, one of such sensors being upstream of the catalyst and the other one of the sensors being downstream of the first sensor; and

- a processor (10) for controlling the hydrocarbon injector in response to the pair of sensors, such processor being programmed to:

- comparing a difference (Δt) in the common parameter detected by the pair of sensors with a predetermined temperature threshold (ΔT_i) (step 610);

- determining an exothermic condition temperature (T_1) from an upstream sensor (24) when the difference in the common parameter is determined to exceed the threshold (step 614, Figure 17);

- comparing the determined exothermic condition temperature with an exothermic condition (550 in Figure 17) expected from the catalyst at a time prior to the determined exothermic condition; and

- modifying the injected hydrocarbon in accordance with the last-mentioned comparison (steps 618 and 620; also see Figure 18 and line 10 of column 9 to line 3

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of column 10) (Hirota et al. determine in advance a desired lower limit catalyst inlet temperature T1 and a desired upper limit catalyst outlet temperature T2 for the optimum reduction of NOx as a function of the degradation extent DR (Figure 17). For a non-deteriorated catalyst, T1 and T2 equal 450 and 550, respectively. If a detected temperature difference (Δt) across the catalyst is different from a predetermined temperature threshold (ΔT_i), a degradation extent DR is calculated (step 612); and a set of desired temperature values T1 and T2 are determined based on the calculated DR (step 614). A hydrocarbon concentration H1 is also determined based on DR).

Re claims 8 and 11, in the system and method of Hirota et al., the common parameter is temperature and wherein the sensors are temperature sensors.

Prior Art

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and consists of four patents: Kraemer et al. (U.S. Patent 5,479,775), Kawaguchi (U.S. Patent 5,701,735), Hirota et al. (U.S. Patent 6,568,178), and Kuenstler et al. (U.S. Patent 6,594,990) further disclose a state of the art.

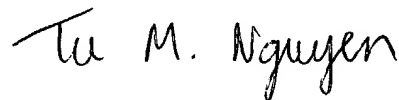
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Communication

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (703) 308-2833.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (703) 308-2623. The fax phone number for this group is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-1148.



TMN

Tu M. Nguyen

May 17, 2004

Patent Examiner

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